



The Sampler

PROTECTING NEW HAMPSHIRE'S LAKES THROUGH THE DEDICATION OF VOLUNTEERS
PUBLISHED BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
VOLUNTEER LAKE ASSESSMENT PROGRAM, SPRING 2007

Exotic Species in their Lake? No Way! VLAPers Save the Day!

by Amy P. Smagula, DES Limnologist and Exotic Species Coordinator

For the past few years, the rate of exotic plant spread in New Hampshire's lakes and ponds has slowed somewhat, from three to four new infestations, to only one or two new infestations each summer. Unfortunately, the summer of 2006 brought with it a higher number of exotic plant discoveries in our lakes once again. Thanks to the actions of some of our Volunteer Lake Assessment Program monitors, we can happily say that two of those new discoveries never made it to the 'infested' list!

During July 2006, VLAP volunteer George Fitzpatrick of Halfmoon Pond in Barnstead



A Weed Watchers training.

contacted DES with a report of a milfoil-like plant growing in a small cove near the outlet of the pond. George duly collected a sample and sent it to DES for verification. DES confirmed its identification as variable milfoil, an exotic species. With the help of George and his pontoon boat, I inspected the site where the plant was found and inspected other parts of the pond, including boat launch sites, shallow and silty areas, and calm coves, to make sure there were no additional plants growing.

Fortunately, the only milfoil growth that was observed, a sparsely populated patch that measured approximately three feet by three feet, was exactly where George had originally

found it. He and his neighbors had also marked the spot with bright yellow buoys to help locate it immediately. DES then dispatched a team of divers to remove the patch by hand in late July. In August, a follow up diving visit was conducted to remove a few additional stems that were persisting. By the end of the growing season, no variable milfoil had re-grown.

George also took further steps to protect Halfmoon Pond from additional variable milfoil growth. At the annual meeting of the lake association, he brought a bucket of milfoil to show the members. Jody Connor, state limnologist, spoke at the meeting about the plant and the problems it poses. The information struck home to many, because when I went out on the pond in August to do another full lake survey of the shallows, everyone that I encountered as I boated around the pond knew of the plant, and indicated that they

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Connor's Corner



by Jody Connor
DES Limnology Center Director

Welcome to the 22nd year of VLAP. We will have a challenge this year as we train a new VLAP coordinator. With Andrea's departure, a large void will need to be filled. Fortunately the staff is pitching in to fill those voids until we hire a coordinator.

VLAP established a record number of participating lakes in 2006. Weed Watchers also continues to grow and has demonstrated its importance in protecting our lakes from exotic aquatic plant infestations through early detection and quick response protocols. As programs expand, coordinators are always looking for new ways to make things easier for our dedicated volunteers. This year, DES will partner with Plymouth State University to set up a satellite laboratory. We hope northern lakes will benefit from this lab by saving travel time and it will encourage other northern lakes to participate in VLAP.

In my last article, I sent out a challenge for volunteers to participate in town politics. Some of you took on this challenge and have brought about changes that will protect the lakes you live on and the town's water resources. Kudos to Joe Farrelly of Deerfield, Tom Paul of Sutton, the towns of Washington and Loudon and the Mountain Lakes District for their dedication to lake protection through watershed overlay ordinances. These

new watershed ordinances should protect these waters for the state, towns and all those who recreate on these waters. For those who are still in the early phases of developing a watershed ordinance or have yet to begin the process, please contact us for more information.

DES encourages volunteers to monitor lakes and tributaries for conductivity and chloride. VLAP trends show an increase in both parameters at lakes throughout the state. The likely sources of increased chloride concentration are road salts and septic systems. If the rate of salt loading to our lakes continues, higher concentrations will affect physical and biological processes within the lake.

The only way to circumvent these issues is to make sure you educate key municipal leaders. Provide a copy of your VLAP report to the local government to inform them of lake trends occurring within the town. Keep them active in solving issues in which municipal activities influence water quality. Town and state roadways have an impact on the amount of water and pollutants that enter a lake. There are new watershed and road runoff treatment technologies available to remove pollutants before they enter a lake. Lake protection and watershed management can be achieved if we all work together.

As we have discussed in past years, lake quality trends are closely linked to seasonal weather patterns. Take for example the 2006 season. Near record rainfall in May and early June dramatically

impacted the state's lakes and ponds. Heavy rains moved higher volumes of particulate matter and bacteria from the watershed to the lake. Suspended solids, phosphorus and bacteria influenced New Hampshire lakes during the early summer. When looking through your VLAP reports, you will likely observe chlorophyll and phosphorus were at their maximum levels while clarity was at its lowest. In fact, some lakes reached all time transparency lows during the 2006 season. DES posted a record number of lake advisories for cyanobacteria. The advisories were likely the result of increased phosphorus loading from the watershed.

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Printed on recycled paper.

Until We Meet Again

*by Andrea LaMoreaux, outgoing
VLAP Coordinator*

During the past six years, I have truly enjoyed serving you as the coordinator of the Volunteer Lake Assessment Program. I have spent many pleasant days sampling with you on New Hampshire's beautiful lakes and ponds and have learned a great deal about why you value your lake or pond, what you think threatens it, and how you are dedicated to protecting it. With mixed emotions, I share the news with you that I resigned from DES on February 9, 2007.

However, I also have good news to share; I did not go very far away. I am now the education director of the New Hampshire Lakes Association (NHLA). I am responsible for setting the educational direction of NHLA and I hope to continue working with you in the future. It was an extremely difficult decision for me to leave VLAP and DES, but moving to NHLA is a challenging career opportunity that will allow me to continue to make New Hampshire a better place for all lake users.

Until I see you again, please do not hesitate to contact me at alamoreaux@nhlakes.org or (603) 226-0299 to say hello and/or to talk about an education project that NHLA can help you with. And, to learn more about NHLA, visit www.nhlakes.org.

Keep up the great work...New Hampshire's lakes need you!

2006 Volunteer Limnologist and Secchi Disk Award Recipient

Since 2004, DES has recognized at least one volunteer for his or her dedication and commitment for volunteer lake monitoring. This award has been appropriately named the Volunteer Limnologist Award because each time a volunteer monitor collects a water sample from a lake or pond, or conducts a Weed Watcher survey, the volunteer is performing the role of a true limnologist. In addition, the Secchi Disk Award is given to the preeminent Volunteer Limnologist Award winner of the year.



*Bob Compton, Deering Lake,
Deering.*

At the 2006 Annual Volunteer Lake Assessment Program workshop, Bob Compton of Deering Lake, Deering, received the Volunteer Limnologist Award and the Secchi Disk Award. Bob has monitored Deering Lake at least three times each summer through VLAP since 1987. He has been extremely active in educating members of his lake association, the watershed, and the community about responsible watershed and lake stewardship. In particular, Bob has worked with the Deering Planning Board to require developers to conduct analyses of nutrient loading to surface waters, and he spearheaded the effort to create zoning ordinances to protect Deering Lake. Since 2005, when the Deering Lake Watershed Ordinance was adopted by the town of Deering, Bob has helped other lake associations develop watershed ordinances.

Congratulations, Bob!

2007 Volunteer Limnologists and Secchi Disk Award Nominees

The following individuals have been selected to receive the 2007 Volunteer Limnologist Award and have been nominated for the Secchi Disk Award:

Ted Covert, Contoocook Lake, Jaffrey
Dave Frucht, Eastman Pond, Grantham
Bill Hallahan, Blaisdell Lake, Sutton
Herb Lippold, Big Island Pond, Derry/Hampstead

Attend the VLAP workshop to recognize the nominees and find out who will receive the 2007 Secchi Disk Award!

Future Nominees

If you would like to nominate someone for these prestigious awards, please send an email or a letter explaining who you have nominated and why to the VLAP coordinator.

A Survey of the Nation's Lakes

by Bob Estabrook, DES Chief Aquatic Biologist

The federal Environmental Protection Agency (EPA) has embarked on a program to assess the condition of the nation's waterbodies. Each year they select one waterbody type to sample (wadeable streams, large rivers, lakes, wetlands, coastal waters). Lakes were selected for sampling in the summer of 2007 under a program called the National Lakes Assessment (NLA). The lakes to be sampled were randomly selected using a probability-based design. Much like a national poll can predict voter preference for the entire country by interviewing a few (perhaps 1,000) randomly-selected individuals, the sampling results from a randomly-selected subset of the nation's lakes can statistically infer the condition of all the nation's lakes. The intent is to repeat the sampling every five years to determine if the overall conditions are improving, worsening or staying the same.

This is a big picture type program. As required by the federal Clean Water Act, it will allow EPA to report to Congress the percent of the nation's lakes that are in good, fair and poor condition, and the relative importance of the key stressors (e.g., bacteria versus nutrients). It will not, however, provide meaningful information on any individual lake. Just as a national poll may not reflect how you would vote as an individual, this national survey will not assess the condition of your lake. The national program does NOT replace VLAP. It is still important for you to continue to monitor your lake



Highland Lake, Stoddard, will be surveyed through the National Survey.

on a regular basis to determine the condition and trends.

The sample size for this project is 1,000 sampling events – 909 discrete lakes (out of 123,439 lakes across the lower 48 states) with 91 re-samples. The sampling design provides for five size classes of lakes (a truly random selection of all lakes would primarily sample small lakes because they are so much more numerous than large ones). All natural and manmade lakes over 10 acres in area, with the exception of the Great Lakes, Great Salt Lake, and treatment and disposal ponds, were included in the selection process. The states were then required to verify that the selected lakes were permanent, non-saline waterbodies at least one meter deep and with at least 1,000 m² (¼ acre) of open water to qualify for sampling.

Thirteen New Hampshire lakes were selected for sampling and all met the criteria: Adder Pond, Andover; Armington Lake, Piermont; Back Lake, Pittsburg; Upper

Danforth Pond, Freedom; Grassy Pond, Rindge; Little Greenough Pond, Wentworths Location; Gulch Mountain Pond, Northwood; Highland Lake, Stoddard; Island Pond, Washington; Long Pond, Pelham; Mirror Lake, Tuftonboro; Sip Pond, Fitzwilliam; and Lake Winnisquam, Laconia. The parameters to be measured and methods are not completely finalized but are expected to include the following: temperature/dissolved oxygen profile, surface composite sample for basic chemistry (anions, cations, pH, ANC, nutrients, conductivity, organic carbon), chlorophyll, Secchi disk transparency, phytoplankton, zooplankton, sediment diatoms, macroinvertebrates, shoreline habitat conditions, bacteria and algal toxins.

Sampling will occur in 2007, lab analysis in 2008, and data analysis and final report by the end of 2009.

Additional information on this project can be found at www.epa.gov/owow/lakes/lakessurvey/.

How are VLAP Lakes Doing?

by Andrea LaMoreaux

VLAP has existed since 1985. As of 2006, approximately 100 lake deep spots have been sampled for 10 consecutive years or more. For these stations, DES has conducted formal statistical analyses to determine if significant changes in water quality have occurred.

Specifically, a simple linear regression analysis has been conducted to determine if increasing, decreasing, or stable trends in deep spot annual mean chlorophyll-a, transparency, and epilimnetic and hypolimnetic total phosphorus concentrations have

occurred since monitoring began. A subjective visual observation test was used to determine if a stable trend, meaning not statistically significantly increasing or decreasing overall trend, was better characterized as a variable trend. The table below lists the overall statistical analysis summary based on the most recent statistical analysis conducted for each deep spot that has been sampled for at least 10 consecutive years.

While some deep spots show improving or worsening trends, most show variable trends.

DES encourages all VLAP groups to sample their lake or pond deep spot at least three times each summer. The more often groups sample the deep spot the more accurately and confidently DES will be able to determine long term trends in lake quality.

If you are having trouble sampling your lake or pond at least three times each summer, please contact the VLAP Coordinator. DES may be able to help you develop a feasible plan to expand your sampling program.

VLAP Deep Spot Long-Term Water Quality Trends (1985 – 2006)

	Chlorophyll-a (106 lake deep spots)	Transparency (Secchi disk) (101 lake deep spots)	Phosphorus: Epilimnion (107 lake deep spots)	Phosphorus: Hypolimnion (96 lake deep spots)
Worsening	8%	22%	11%	6%
Improving	9%	5%	10%	8%
Stable	5%	10%	4%	3%
Variable	78%	63%	75%	82%

Attend the Annual Volunteer Lake
Assessment Program Workshop!

May 19 in Concord

The 2007 VLAP Annual workshop will be held on Saturday, May 19, at the Department of Environmental Services in Concord from 8:30 a.m. to 12:30 p.m. There is no fee for this workshop and complimentary snacks and beverages will be provided.

All workshop participants will learn about the latest lake-related legislative updates, VLAP program updates, and the economic cost of declining water quality in New Hampshire. Also, the recipient of the 2007 Secchi Disk Award will be revealed.



Attendees can choose to attend two of the three following sessions: Aquatic Plant Identification Workshop, Lake Ecology and Sampling Refresher, or Ask the Experts question and answer session.

If you would like to attend, please contact Amy Smagula, DES Exotic Species Coordinator, at (603) 271-2248 or asmagula@des.state.nh.us.

Ducks and Geese: Don't Invite Them to Your Beach!

by Sara Sumner, DES Beach Program Coordinator

The snow is slowly melting and the flowers are starting to bloom. The smell of spring is in the air. Soon summer will arrive and it will be time to put on your bathing suit, grab your beach chair and take a trip to the beach! While you enjoy a nice day at the beach, inevitably a duck or two, or possibly three or four geese, will beg for a piece of your sand-spiced sandwich. Now, you may be tempted to offer up a piece of your bread, but you should think twice. Not only will you attract these uninvited guests to the area, you will also be supplying them with ammunition to pollute the beach.

Canada geese, for example, have caused numerous problems at freshwater beaches in past years. One goose can consume up to four pounds of grass per day, creating three pounds of fecal matter. These grazing machines defecate up to 28 times per day! When the fecal matter is introduced to

the water, it can contribute to excessive loading of nitrogen and phosphorus, causing algal blooms and excessive plant growth. In addition, fecal matter may cause elevated levels of bacteria and pathogens in the water, which can be potentially harmful to those who swim or wade there.

Another common beach contaminator is the mallard duck. Ducks can contribute up to 2.5 million *E. coli* colonies per day. Now, imagine a group of 40 ducks; they could potentially contribute up to 10 billion *E. coli* in one day! Another problem with duck populations is that they can also contribute to a rash commonly referred to as Swimmers' Itch. Humans are susceptible to Swimmers' Itch, which is caused by an allergic reaction to the *Cercaria* parasite of birds and mammals. The ducks defecate, releasing these parasites into the water where snails become infected. The parasite uses



Opechee Park, Laconia.

the snail as a host, where it matures and is then released back into the water. Symptoms of Swimmers' Itch are tingling, burning or itching of the skin within minutes or even days of contact. Within 12 hours, reddish pimples appear, which may develop into blisters.

Swimmers' Itch is not a health hazard, but if you become infected, please contact the Beach Program at (603) 271-8803 or ssumner@des.state.nh.us, and fill out an illness report form, which can be found at www.des.nh.gov/Beaches/form.html.

Do You Have a Beach Erosion Problem?

Does your beach look like this?



Before: A sloping, sandy beach that erodes during rain events and contributes unwanted sand and nutrients to the lake.

Would you like your beach to look like this?



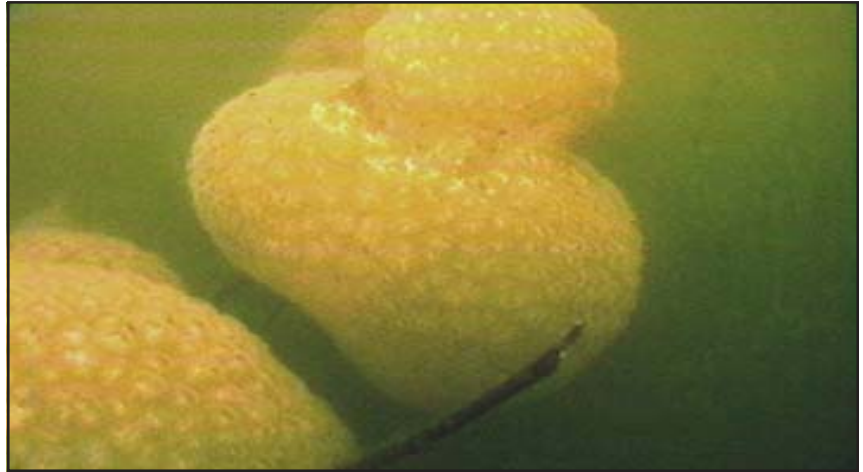
After: A perched beach has been constructed. Infiltration trenches divert runoff away from the beach, and the beach, which is now flat, no longer erodes into the lake during rain events.

If you have a beach erosion problem, read the article "Perched Beaches Protect and Improve Water Quality," which can be found in Appendix D of your 2006 VLAP Annual Report and on the VLAP website at www.des.nh.gov/wmb/vlap/2006.

Bryozoans in New Hampshire Lakes

by Rebecca Lelesi, VLAP Intern

During the summer of 2006, numerous large gelatinous balls—looking very much like alien creatures—were sighted in Rand Pond in Goshen. These “alien-like creatures” were simply bryozoans; an aquatic invertebrate, an animal with no backbone, which is sometimes called a “moss animal.” They are sighted frequently throughout New Hampshire, although it is difficult to predict which lakes will have bryozoans in any given year.



A freshwater bryozoan.

(Source: www.bio.umass.edu/biology/conn.river/bryozoa.html)

Bryozoans come in many different shapes and sizes. Some bryozoans are very small and wispy, while others form large gelatinous balls that can be up to two feet in diameter!

While there are more than 5,000 bryozoan species worldwide, only about 50 species inhabit freshwater, all other species are found in marine environments. Bryozoans also have an extensive fossil record dating back 500 million years with more than 15,000 different species. They outdate dinosaurs by 270 million years, and are some of the oldest creatures on Earth.

Biology of a Bryozoan

A bryozoan is a colonial animal similar to coral. A colonial animal is made up of many individuals who all perform certain tasks to maintain the function of the group. The individual animal in a bryozoan is called a zooid and it is only about one millimeter long. Considering how simple the individual is, the colony is quite complex. A bryozoan has an outer layer that protects a digestive tract. Bryozoans are

filter feeders that eat phytoplankton (algae) and detritus (organic matter from dead plants and animals). The mouth has a crown of tentacles, which direct food into to the mouth. A large colony can filter a significant amount of water in a day, which can be very good for a lake with too much algal growth.

The bryozoan forms statoblasts to survive the winter. A statoblast has a tough outer layer that protects a single zooid with its food supply. The statoblast can survive both drying-out and freezing. When the water warms up in the spring, the protective layer is shed and the zooid inside begins copying itself to create a new colony.

Habitat and Predators

Freshwater bryozoans prefer still to slow-moving water because they are delicate and easily broken apart by strong currents. Bryozoans are often found in nutrient-enriched water because of the plentiful supply of plankton. Bryozoans are immobile and attach to

rocks, submerged trees, docks, or anything stable that is underwater. The predators of freshwater bryozoans are mainly fish, but raccoons also eat the gelatinous species.

There is some controversy in the literature as to whether bryozoans are tolerant or intolerant of pollution. As more research is conducted, it will become clear. One thing is clear, bryozoans are a natural occurrence, not a mutation caused by pollution.

Bryozoans and Human Health

Bryozoans are not hazardous to human health and do not indicate a pollution problem. Because bryozoans are filter feeders they may actually help clean the water.

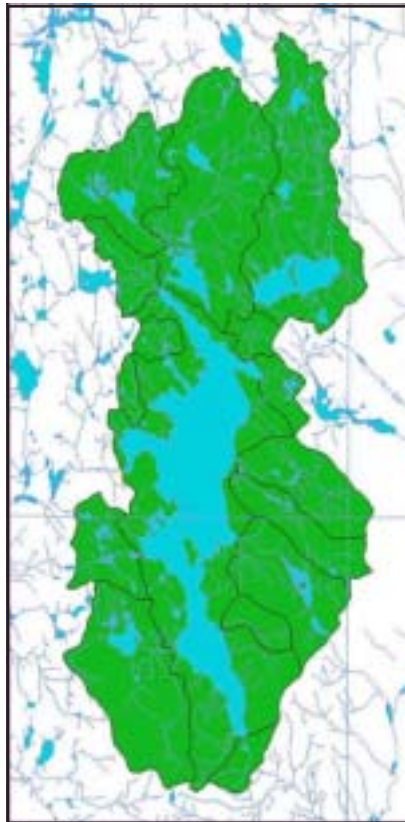
Now that you know a little bit more about these animals, you should consider yourself lucky if you find a bryozoan in your lake. Not only are they unique and one of nature's oldest animals, they may actually be beneficial by helping to clean the water of the lake.

Making Strides in Promoting Responsible Watershed Stewardship

by June Fichter, Executive Director, Lake Sunapee Protective Association

The Sunapee Area Watershed Coalition (SAWC) was organized in January 2005, to promote local efforts to protect water quality, raise community awareness of important watershed issues, formulate clear guidelines for responsible, long-term stewardship of water resources, and encourage cooperation among Sunapee watershed towns to manage and protect water resources for the common benefit of the area communities.

SAWC is made up of representatives from each watershed town (Goshen, Newbury, New London, Springfield, Sunapee and Sutton), the Lake Sunapee Protective Association, Colby Sawyer College, Upper Valley Lake Sunapee Regional Planning Commission, several lake and pond associations and interested watershed residents. The coalition was formed to develop a long-term watershed management plan for the Lake Sunapee watershed. When completed, it will be one of two watershed management plans developed under the NH Department of Environmental Services' "watershed approach." It is anticipated that the watershed plan with its recommendations, will be accepted by the



Lake Sunapee and its watershed
(Source: www.quackenbos.com/lspa_new/start.asp)

towns into their master plans. Protection and enhancement of watershed resources will result as recommendations are implemented during future years.

During 2006, the SAWC made great strides! There are three SAWC subcommittees each

focused on a distinct subject for watershed planning: Land Use, Water Quality, and Education. The following three projects, supported by a DES grant, were initiated and are all nearing completion:

- Developing a water quality model, which will take watershed input variables, such as the number of residences, and predict resulting phosphorus loading in waterbodies.
- Assessing town building and site regulations and recommending regulations.
- A build-out analysis to determine the development potential within the Lake Sunapee watershed.

During 2007, the SAWC, with assistance from the Granite State Rural Water Association, will develop a Watershed Planning Committee. This committee, consisting of 12 to 15 members with diverse watershed interests, will work specifically on the watershed plan.

For more information, contact June Fichter, LSPA executive director, at (603) 763-2210.

Did you know that the 2006 Annual V LAP Report for your lake or pond is posted on the DES website?

Check it out at: www.des.nh.gov/wmb/vlap/2006

Share this information with your lake association and community!

Find the Pot of Gold at the End of the Rainbow

by Alicia Carlson, DES Environmentalist

Are you looking for funding for a project on your lake or in your watershed? Have you exhausted your fundraising ideas? There are many opportunities available to fund your projects – you just need to find them! Here are a few ideas on sources of funding and resources to write grants.

Funding Sources

Most of the sources listed below are local organizations. Some give preference to New Hampshire and New England projects, while others are national or global in scope.

The Corporate Fund, Concord, NH: Awards funds to non-profit groups to help build their capacity. www.thecorporatefund.org

New Hampshire Charitable Foundation, Concord, NH: Community Impact Grants address a range of opportunities to improve New Hampshire's communities. There is a list for Special Purpose Grants, funded by foundations, which are more specific in their reach. www.nhcf.org

New Hampshire State Conservation Committee Conservation Grant Program, Concord, NH: A small grants program that is funded by the purchase of the "moose plate" conservation and heritage license plates. www.mooseplate.com/grants.html

Stonyfield Farm, Londonderry, NH: Provides grants to organizations and projects that are committed to protecting the earth. www.stonyfield.com – Click on "Earth Actions," then "Giving profits to the Earth."

Ben and Jerry's Foundation, South Burlington, VT: Funds grassroots organization projects that lead to societal, institutional and/or environmental change. www.benjerry.com/foundation

New England Grassroots Environment Fund, Montpelier, VT: A small grants program designed to foster and give voice to grassroots environmental initiatives in New England. www.grassrootsfund.org

Resources for Grant Writing

Grant writing may sound like a daunting task. With a little help from the organizations listed below, you, or someone in your association, may become a grant writing expert!

Foundation Center Proposal Writing Short Course: The Foundation Center is a resource for non-profits that provides tools to locate grant makers and gain knowledge of grant writing. The Proposal Writing Short Course is a primer on the grant writing process. foundationcenter.org/getstarted/tutorials/shortcourse/index.html

University of Wisconsin-Madison Grants Information Collection: The University of Wisconsin provides several resources through its website. grants.library.wisc.edu - Click on "Proposals" for a list of internet resources.

Non-Profit Guides' Grant Writing Tools for Non Profits: This website includes more grant writing guides with example proposals and other components. www.npguides.org

Grant Writing for Dummies: Great resource with practical suggestions. Visit your local book store!



Beaver Lake, Derry.
(Source: www.beaver-lake.org/gallery/index.htm)

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Although too early to predict spring wetfall, the state has little snow pack. If the region continues in this low wetfall pattern, less solids and phosphorus should reach our waterbodies. This will result in improved lake quality trends for 2007.

Many lakes were covered by ice in mid-January and the cold February helped to make a generous ice layer. Many larger lakes will not have ice-out until mid-April. This will result in later lake mixing. The season will begin with an annual diatom increase, resulting in a brown color and higher turbidity in late April into early May.

If drier conditions prevail, expect lower to average runoff rates and less phosphorus loading than in 2006. Aquatic plant growth will begin earlier this season as increased light penetration and decreased turbidity will encourage plant growth, especially exotic plants like milfoil. The decreased littoral zone will cause increased competition among the early spawning fish species. As sunlight warms the waters, fish populations may experience a more stressful spawning season resulting in an increased rate of fish mortality.

Dominant populations of green and golden brown algae may occur in many lakes by July. If we have a sunny spring, the appearance of filamentous

green algae may become prevalent in early July. Decreased phosphorus loading should be helpful in reducing the number of lakes that have chronic cyanobacteria problems. I anticipate a later appearance of cyanobacteria this season but those lakes that have chronic problems should be looking for cyanobacteria throughout the month of August.

As always, you are welcome to contact us if you have questions and concerns with lake quality or watershed activities that may potentially impact lake quality. I appreciate all your long hours and dedication to keeping our lakes clean.

Forging a Watershed Community

Since January 2006, the Beaver Lake Watershed Partnership (BLWP) has met four times with nearly 45 stakeholders from Auburn, Chester, and Derry participating to form recommendations for a cohesive management plan for the Beaver Lake watershed. The partnership held a meeting on January 10, 2007, to provide a first look at its management plan recommendations.

The draft Management Plan uses a logic model approach with a framework of goals, measurable objectives, and supporting activities along with specific outcomes for each objective and resources identified to implement the activities.

The project began when the BLWP was funded through a Watershed Assistance Grant from the NH Department of Environmental Services and

administered by the Beaver Lake Improvement Association. The project also includes conducting a watershed survey, creating a Beaver Lake watershed ecology curriculum, maintaining a website, and documenting the entire process with a video production. Naturesource communications, Boscawen, was selected as the project consultant lead with team member Gomez and Sullivan Engineers, PC. The Beaver and Harantis Lakes Vlap data as well as other DES studies are providing valuable data and guidance for the management plan.

The Beaver Lake Watershed Management Plan process and projects are well ahead of schedule. The partnership looks forward to working with the consultant team to continue to implement activities through the end of the project



Vlap tributary sampling at Beaver Lake, Derry.

period in December.

For more information, contact Michele L. Tremblay, naturesource communications Project Team Manager, at (603) 796-2615 and mlt@naturesource.net or visit the partnership at BLWP.net

VLAPers Save the Day
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had been searching their shorelines and other areas of the lake. Nice work!

We had another similar success story on Rockybound Pond in Croydon. Liz Lee, lake resident and VLAP volunteer, was snorkeling along the lake edge when she found some suspicious looking plants. They were tall with very wavy narrow leaves. As the plants did not look familiar to this frequent snorkeler, she collected them and sent them to DES for analysis. The plants were identified as the exotic curly-leaf pondweed. Though not common in New Hampshire, this invasive exotic plant has two spurts of growth during May and August, and it can quickly take over a lake.

Working with Liz, I asked her if she could use buoys or bottles to mark the spots of growth in Rockybound Pond. She took on that challenge with gusto, providing detailed information to DES divers about where to find the plants in the eight to ten-foot depth zones of the pond. DES dove the site and removed between 20 to 30 mature stems of the plant that ranged from one to two-and-a-half feet tall.

Liz also asked for some fact

sheets and photographs of the plant so that she can share that information with her fellow lake residents putting them on alert for regrowth.

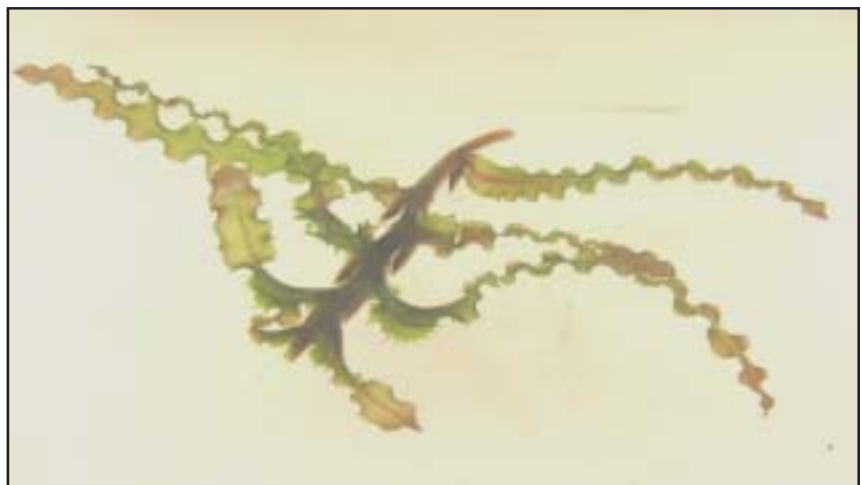
Finally, a similar circumstance happened on Great East Lake in Wakefield. Though not a VLAP lake, they have an active Weed Watcher Program, which allowed them to catch a new stem of variable milfoil growth at the boat launch. This stem was removed, and no other plants were found in that waterbody by the end of the season.

Each of these waterbodies will be monitored for the next few growing seasons to ensure that there is no regrowth. It is a credit to the VLAP monitors, Weed Watchers, and lake residents that there were

active monitors with eyes open at all times. They are each responsible for saving their lakes from the perils of exotic species infestations.

If you or your lake are not already a part of the Weed Watcher Program, please contact Amy Smagula at asmagula@des.state.nh.us or (603) 271-2248. We can come train a group of people on your lake, and provide you with the information that you need to start up the program. Early detection can save your lake. Start now!

Please visit the Exotic Species website at www.des.nh.gov/wmb/exoticspecies/documents/PlantBook.pdf to see a new plant identification book coming out this spring/summer.



Curly-leaf pondweed, an exotic aquatic plant.
(Source: Karen Hahnel, MADEP)



Moores Pond, Tamworth.

“Lakes seem,
on the scale of years or of human life spans,
permanent features of landscapes,
but they are geographically transitory,
usually born of catastrophes,
to mature and to die quietly and imperceptibly.”

G. Evelyn Hutchinson (1903 - 1991)
Considered by many to be the Father of Limnology.

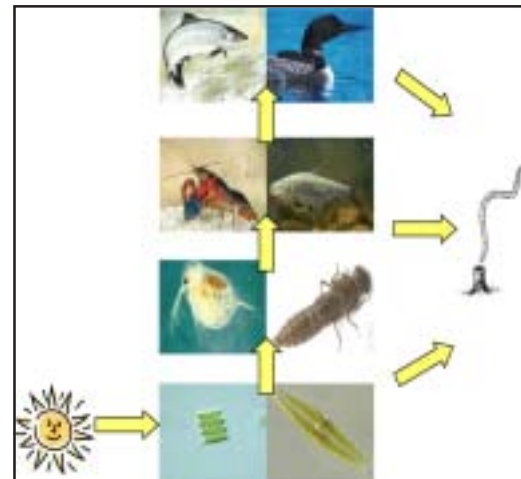
Limnologists In Training

by Alicia Carlson, DES Environmentalist

Life In Our Lakes

Do you like lakes that have a lot of plants and animals? Or, do you prefer NO plants and animals in your lake? Everyone has their own opinion, but let me explain why at least some plants and animals are beneficial to a lake.

Scientists use categories to place plants and animals according to their contributions to the diet of an **ecosystem**. This is known as a **food chain**. This is an easy way to explain what each animal eats and how the animals relate to one another. An ecosystem contains animals and plants that have adapted over the years to sustain and consume one another. Each organism is equally important to the health of the ecosystem.



Example of a food chain found in a lake.

Let's start at the bottom of the food chain and move our way up. The **primary producers** make their own food through photosynthesis (they use the sun and available nutrients to make their food). They include plants and microscopic algae (**phytoplankton**). **Primary consumers** are animals that eat the primary producers. Zooplankton, tadpoles, most insects, and moose are examples of primary consumers. A **secondary consumer's** diet may consist of a mix of primary producers and primary consumers. Small fish species, crayfish, and the young of larger fish species are considered secondary consumers. **Tertiary consumers** are the big animals, like salmon, bass, and otter. They eat the secondary consumers.

But, what happens when these animals and plants die? There are organisms (worms and bacteria) called **decomposers** that break down all the dead material. They leave nutrients for the primary producers to use during photosynthesis, thus completing the cycle of the aquatic food chain.

Using the **bolded words** above, fill in the sentences below. Answers are on page 15.

1. A _____ describes how plants, animals, and other organisms depend on each other for food as part of an _____.
2. There are several categories in a food chain. Plants and _____ make their own food by using sunlight and nutrients. The organisms in this category are called _____.
3. Animals like crayfish are called _____ because they eat other animals. The organisms the crayfish eat, like zooplankton and insects, are called _____ because they eat the producers.
4. Organisms that break down dead organisms are called _____.

The Interactive Lake Ecology (ILE) student and teachers' workbooks are available for purchase! The curriculum includes chapters on lake formation, water properties, the water cycle, the aquatic food chain, watersheds, pollution, non-native species, lake testing and classification. In addition, vocabulary exercises, experiments, and activities are included. While this curriculum was originally designed for middle school students, it can be adapted for older students and adults. For information, contact Alicia Carlson at (603) 271-0698, or visit the ILE website at www.des.nh.gov/wmb/ILE.



More Sampling Tips

by Andrea LaMoreaux, outgoing VLAP Coordinator, and Rebecca Lelesi, VLAP Intern

In previous newsletters, we have provided you with tips on how to build your own sampling equipment, including a Secchi disk, integrated sampler, sampling pole, and viewscope, which we hope has made it more convenient for your group to sample your lake or pond. This year, we have some additional sampling tips to share that should make your sampling events easier, more efficient, and more enjoyable.

- Make your own sample labels and pre-label the bottles before sampling. Make sure the labels and ink are waterproof and fold one corner of the label over for easier removal from sample bottle after the water has been analyzed.
- Purchase a hand-held depth finder to locate the deep spot more efficiently and accurately.
- Make a homemade anchor using cement blocks, exercise weights, or a large rock.
- Set a well-anchored buoy (an old milk jug works well) to mark the deep spot, and check it periodically for drifting. Reposition the buoy as necessary.
- Use a cork or plumbing valve to plug the integrated tube so that you don't have to crimp it by hand.
- Lower a clean bucket from a bridge or other platform to collect tributary samples. Tape a rock to the front side of the bucket to help it tip into the water rather than floating on the surface.



Jean Martin, Crystal Lake, Gilmanton.

If you have any additional tips you would like to share with your fellow volunteer monitors, please send these to the VLAP Coordinator and your tips will be included in a future newsletter.

How You Can Protect your Lake from Sand Dumping



Sand application along the shoreline can harm your lake.

Activities that local residents and lake association members can undertake to help protect a lake from excessive sand dumping include the following:

- Educate residents, association members, and town officials about the requirement for a state permit to create or enhance a beach, and about the negative impacts of such activities.
- Encourage association members to minimize the use of sand dumping by adopting an association policy to that effect.
- Work with town officials to adopt a local ordinance to prohibit or restrict the use of sand dumping along lake shores. One approach is to limit the size of beaches.
- Report illegal sand dumping incidents to the DES Wetlands Bureau using the form at www.des.nh.gov/Wetlands/pdf/complain.pdf or (603) 271-2147.

10 Steps for Conducting a Successful Clean-up Event

by Jen Drociak, DES Volunteer River Assessment Program Coordinator

Since 2000, the Manchester Urban Ponds Restoration Program (UPRP) has coordinated spring and autumn clean-ups at seven ponds within the city. From 2000-2006 the UPRP organized 52 clean-up events. To date, over 200 volunteers have spent 836.5 hours collecting 622 bags of trash! This does not include the items illegally dumped such as shopping carts, tires, car batteries, other car parts, construction debris, and other items. In addition, the value of volunteer time spent at these clean-ups has amounted to over \$16,000.

The following are ten steps that your lake association or group can take toward conducting a successful shoreline clean-up event.



Nutts Pond clean-up, 2000.

1. Partner with Existing Organizations

Some of the best volunteer attendance has been through partnerships with existing organizations. Form partnerships and advertise your clean-up event with local high school biology or ecology clubs, community college or university extracurricular programs, or existing local groups who may take an equal interest in your event.

2. Gather Needed Supplies

Partner with Municipal Departments

Partnering with municipal departments such as your parks and recreation department and/or highway department can allow you access to tools and services at no expense. For example, the Manchester Parks and Recreation Department has been providing the UPRP plastic refuse bags, latex and work gloves, rakes and other tools for clean-up events. Similarly, the Manchester Highway Department has helped remove and weigh the trash collected at each clean-up event.

Partner with Local Businesses

Contact local businesses for donations such as supplies, beverages and snacks and/or prizes. Local businesses may also be able to provide donations towards printing or copying informational flyers or costs associated with advertising in local newspapers, radio or television spots.

3. Advertise!

Advertise your clean-up event in several ways. Create an e-mail list and send information to those on your list. This information can also be forwarded to other potentially interested individuals. Post clean-up event date(s) and information on your lake association and municipal website. Place an advertisement on your community access television and in local papers. Post clean-up event date(s) and information on local kiosks around the lake at public spaces such as parks and boat ramps.

4. Have Participants Sign-In and Track Volunteer Time

To account for the number of participants in attendance, and to create or add to an email or mailing list, create a sign-in sheet and have volunteers sign in with their contact information. Be sure to also track volunteer hours of each participant, so that volunteer time and the value of volunteer time can be accounted for at the end of the event and over time. The value of volunteer time can be found and calculated by visiting www.independentsector.org.

Successful Clean-up Event
continued from previous page

5. Educate Participants

When volunteers arrive, educate them about the status of your lake or pond. Have a brief discussion regarding some of the issues facing your lake or pond, and the importance of not only maintaining the water quality of the lake or pond itself, but the quality of the watershed as a whole.

6. Practice Safety and Dress Appropriately

Remember to educate participants on the importance of safety during the clean-up event. Encourage participants to wear latex or work gloves while collecting refuse. Remind volunteers to keep to the immediate shoreline and not to wade into the water without assistance. Keep a first aid kit on hand in case of an emergency. In addition, encourage participants to dress appropriately for the weather and situation. Individuals who may be wading in water should be equipped with knee-boots or waders.

7. Keep Track of What You Find

During your clean-up event, you will most-likely find typical items such as aluminum, glass, and plastic bottles, as well as candy wrappers, snack packages, and perhaps cigarette butts. Depending on the location, you may also find items that have been illegally dumped, such as tires and car batteries. To keep track of what you find, have participants or groups separate recyclables, or count items found. At the end of the clean-up event, weigh the trash to obtain the number of pounds removed from the shoreline or in-lake areas.

8. Document the Event

Take photos of volunteers during the clean-up event and a group photo around the trash collected to document the event and publicize future events.

9. Keep it Interesting and Reward Volunteer Participants

Turn the clean-up event into a “scavenger hunt” for children and award prizes for “Most Interesting Object Found,” “Most Cans Collected,” or “Largest Item Retrieved.” Be creative!

10. Acknowledge Volunteer Contribution

After the clean-up event, send a personalized Thank You card or create and send a Spirit of Community Certificate of Appreciation to each participant.



McQuesten Pond clean-up, 2003.

Good Luck!

For more information on the Manchester Urban Ponds Restoration Program, visit www.manchesternh.gov/urbanponds or e-mail urbanponds@gmail.com.

Limnologists in Training Answers

(from page 12)

1. food chain, ecosystem
2. phytoplankton, primary producers

3. secondary consumers, primary consumers
4. decomposers

New Hampshire Department of Environmental Services
Water Division, Watershed Bureau, Biology Section
PO Box 95
Concord, NH 03302-0095

8522

Upcoming Events

May 19, 2007: DES Volunteer Lake Assessment Program Annual Workshop. DES, Concord, NH. For more information, refer to announcement on page 4 or visit www.des.nh.gov/wmb/vlap/events.htm.

June 8-9, 2007: New England Chapter of the North American Lake Management Society Annual Conference. University of Connecticut, Storrs, CT. For more information, visit www.nalms.org/symposia/events.htm.

June 23-July 15, 2007: The Great North American Secchi Dip In. For more information, visit dipin.kent.edu.

June 29, 2007: 2007 Lakes Congress. Hosted by the New Hampshire Lakes Association, NH Audubon McLane Center, Concord, NH. For more information, visit www.nhlakes.org.

October 29-November 3, 2007: North American Lake Management Society 2007 International Symposium. Orlando, FL. For more information, visit www.nalms.org/symposia/events.htm.

Have you
scheduled
your annual
DES
biologist visit
yet?

If you haven't,
please contact
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